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# **Crop Discrimination and Spectral Features for Crop Classification**

LECTURE 3



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## 3.1 Introduction

- Currently computers are being used automation and to expand decision support system (DSS) for the agricultural research
- Remote Sensing is an efficient technology and worthy source of earth surface information. as it can capture images of reasonably large area on the earth
- Agricultural crops are significantly better characterised, classified, modelled and mapped using hyperspectral data.



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## 3.1.1 Feature Extraction

- Feature extraction is the process of defining image characteristics or features which effectively provides meaningful information for image interpretation or classification.
- The ultimate goals of feature extraction are:
  - Effectiveness and efficiency in classification.
  - Avoiding redundancy of data.
  - Identifying useful spatial as well as spectral features.
  - Maximising the pattern discrimination



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## 3.1.2 Role of texture in classification

- As it is possible to distinguish between regular textures manifested by man made objects hence, this texture characteristic is used to discriminate between divergent objects
- Grey value relationship is obtained from segmentation both by conventional texture analysis and grey level co-occurrence matrix (GLCM)
- GLCM method analyses within GLCM space not from original grey values



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## 3.1.3 Grey Level Co-occurrence Matrix (GLCM)

- The **GLCM** can be viewed as two dimensional histogram of the frequency with which pairs of grey level pixels occur in a given spatial relationship, defined by specific inter-pixel distance and a given pixel orientation
- Hence this segmentation of urban objects , texture analysis are usually performed by **GLCM**



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## 3.1.4 Local Binary Pattern (LBP)

- It is a simple yet very efficient texture operator which labels the pixels of an image by thresholding the neighbourhood of each pixel and considers the result as a binary number.
- Due to its discriminative power and computational plainness, LBP texture operator become a popular approach



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## 3.2 Spectral Features for Crop Classification

- Band selection
- Narrow band vegetation indices



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## 3.3 Importance of Hyperspectral Remote Sensing

- Spectrum allows us to study very specific characteristics of agricultural crops
- Non-imaging sensors gave spectral signatures with approximate 1-10 nm sampling rate which is very effective for distinct feature identification
- Narrow band vegetation indices play an important role for mapping plant biophysical and biochemical properties of agricultural crops
- It gives detailed information about crops but it is necessary to select appropriate bands





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**THANK YOU**